

Attacks on Science: The Risks to Evidence-Based Policy

Linda Rosenstock, MD, MPH, and Lore Jackson Lee

As government agencies, academic centers, and researchers affiliated with them provide an increasing share of the science base for policy decisions, they are also subject to efforts to politicize or silence objective scientific research. Such actions increasingly use sophisticated and complex strategies that put evidence-based policy making at risk.

To assure the appropriate use of scientific evidence and the protection of the scientists who provide it, institutions and individuals must grow more vigilant against these tactics. Maintaining the capacity for evidence-based policy requires differentiating between honest scientific challenge and evident vested interest and responding accordingly, building and diversifying partnerships, assuring the transparency of funding sources, agreeing on rules for publication, and distinguishing the point where science ends and policy begins.

AS GOVERNMENT AGENCIES, academic centers, and their researchers increasingly provide the science base for policy decisions, they are also subject to forces that seek to politicize or silence objective scientific research. We refer not to the honest differences and conflicts that arise in response to scientific uncertainty, but to the pressure to use science to justify policy (even when the data are inadequate), as well as the vulnerability of science to attacks driven by vested interests—interests that exploit scientific uncertainty to deflect attention from what is known and from the actions that would credibly follow that knowledge.

Attacks on science are not new. Galileo, for example, was charged with “vehement suspicion of heresy” and put on trial in 1633 when he was 69. To save his life, Galileo publicly renounced his belief that the sun, not the earth, was the center of the universe. In 1992, after more than 350 years had passed, the Vatican deferred to Galileo’s scientific theory and granted him a full pardon.^{1–3}

As attention and respect for scientific research grow, attempts both to overdetermine scientific findings and to undermine the policy implications of sound science are becoming increasingly sophisticated and complex, putting evidence-based policymaking at risk.

USING SCIENCE FOR POLICY MAKING

The increasingly global economy is influencing investments in research, scientific publications, and research alliances.⁴ US health research and development funding has increasingly shifted from public to private sources. Between 1965 and 1995, the proportion of health research and development funded by federal sources dropped by almost half, to 37.4%, while industry’s financial support increased more than 2-fold, to 52% of the total \$35.8 billion expended.⁵ Nearly 12% (\$1.5 billion) of research funds to academic institutions now come from the corporate sector.⁶ Universities are also increasingly turning to Congress as a direct source for research funding; universities and their lobbyists have secured more than \$7 billion since 1980 through congressional earmarks inserted into spending bills.⁷

Meanwhile, the public is demonstrating an increasing interest in technology and health. Developments in medicine and health care outranked moral values, the stock market, national policies, and television content in a recent survey of the issues that most affect peoples’ lives.⁸ Approximately 1 in 5 people in the United States consider themselves very well informed about the use of new inventions and technolo-

gies and 40% have a great deal of confidence in the leadership of the scientific and medical communities, a level that is far higher than levels reported for the leadership of other major institutions in society.⁴ This trust may be at risk, owing to a number of forces that are arrayed to influence the use of scientific evidence.

TACTICS USED TO UNDERMINE SOUND SCIENCE

A wide array of vested interests—and here we mean those who, for whatever reason, are committed to a predetermined outcome independent of the evidence—may drive the undermining of sound science to forestall the policy implications that would necessarily follow. These interests, which are often financial but may also be emotional, ideologic, and political, may be acting alone or in combination. Although economic interest is a common motivation and may drive both corporations and individuals (e.g., lawyers, physicians), emotional interests have played an increasing role in undermining sound science to achieve their desired ends (as in the case of victims’ groups). The role of corporate interests has been best reported, at least in part because of the significant economic resources corporations can bring to bear to influence policy outcomes.

Economic Manipulation

First and foremost, vested interests may use money to inhibit or stall sound science. The increasing role of industry-sponsored research, despite its many benefits, also raises concerns. At the extreme are instances in which an industry sponsors research with the direct goal of countering existing scientific opinion. Economic interests may adversely affect scientific integrity through the delaying or withholding of research results and by directly or indirectly influencing the content of results.

In a survey of more than 3000 scientists in the 50 universities that received the most National Institutes of Health funding in 1993, 20% of respondents reported delays of more than 6 months in the publication of their research results at least once in the previous 3 years to allow for financial interests, such as patent applications, or to slow the dissemination of undesired results.⁹ Another study of corporate investments in academic research found that donors often expect the right to prepublication review of research results, ownership of patent rights, and future consulting relationships.¹⁰

Still other studies have found a strong association between authors' opinions and their financial affiliations. A review of studies on selected chemicals (alachlor, atrazine, formaldehyde, and perchloroethylene) found that 60% of studies conducted by nonindustry researchers found these chemicals hazardous, while only 14% of industry-sponsored studies did so.¹¹ A review of 70 articles about the use of calcium-channel antagonists found that 96% of the authors supportive of their use had financial relationships with manufacturers of cal-

cium-channel antagonists, compared with 60% of neutral authors and 37% of critical authors.¹² A study of review articles on the health effects of passive smoking found that 74% of those who disclaimed the widely held view of the relationship between health effects and environmental tobacco smoke had affiliations with the tobacco industry.¹³

Federal research is not immune to this type of economic influence, which is usually brought to bear through congressional channels—often in response to vested interests—mostly through specific appropriations or barriers to appropriation. A program or, occasionally, an entire agency may become the victim of such efforts. The Department of Health and Human Service's Agency for Health Care Research and Quality, then known as the Agency for Health Care Policy and Research, was slated for zero funding in fiscal year 1996 after an organization of orthopedic surgeons, angered over the agency's science-based recommendation of nonsurgical approaches for managing acute back problems, lobbied Congress.¹⁴ Similar efforts were launched by the same Congress to eliminate or reduce funding for the Centers for Disease Control and Prevention's National Center for Injury Prevention and Control and the National Institute for Occupational Safety and Health.^{15,16}

Vested interests also use hired scientists, on a full-time or very lucrative part-time basis, for special tasks that aim to derail the use of sound science. Ongoing tobacco lawsuits uncovered a tobacco industry investment of \$156 000 to hire more than a dozen scientists to write letters and manuscripts discrediting a 1993 federal report that linked

secondhand smoke to lung cancer. These "for hire" materials appeared in the likes of the *Journal of the American Medical Association*, the *Journal of the National Cancer Institute*, *Risk Analysis*, the *Journal of Regulatory Toxicology and Pharmacology*, and the *Wall Street Journal*.¹⁷ Pharmaceutical companies have employed similar tactics, paying for favorable articles and editorials.¹⁸

Delay

When economic manipulation fails to influence research, vested interests turn to a complex arsenal of delaying tactics to forestall the release or influence of scientific evidence. These tactics include initiating litigation, fighting for access to raw data, funding parallel studies, inundating researchers with administrative procedures, and catalyzing congressional reports or inquiries. One of the favorite delay tactics is demanding greater or different peer review, such as invoking the Federal Advisory Committee Act to fault agency approaches to peer review.

A prime example is an ongoing effort to retard work on the development of a national occupational ergonomics standard. Since fiscal year 1995, the heavily lobbied Congress had either proposed or passed ergonomics riders to the Occupational Safety and Health Administration appropriations, prohibiting or delaying work on development of the standard. In 1998, Congress also commissioned a National Academy of Sciences study to review, among other things, a 1997 study released by the National Institute for Occupational Safety and Health (NIOSH) that found a positive relationship between specific work activities and the development of musculoskeletal dis-

orders of the back, neck, and upper extremities.¹⁹

Although the National Academy of Sciences study heartily supported NIOSH's conclusions, in fiscal year 1999 Congress again asked the academy to review the same issues.²⁰ Not surprisingly, since the large scientific data base remained the same, the second review corroborated the conclusions of the first.²¹ The delay process proved ultimately successful when one of the first acts of the incoming Bush administration was to withdraw the long-delayed but just-finalized ergonomics standard that had been promulgated in the last weeks of the Clinton administration.

Hidden Identities

In attacking science, vested interests may also hide their identities by masquerading as grassroots coalitions or by affiliating themselves with neutral organizations. Consider, for example, the National Coalition on Ergonomics, a research group that opposes a national ergonomics standard; the Food Chain Coalition, which represents the pesticide industry and works to prevent regulations; Doctors for Integrity in Research and Public Policy, physicians who oppose gun control and handgun research; and the Center for Patient Advocacy, the orthopedic group that lobbied against the Agency for Health Care Policy and Research's back treatment recommendations.^{14,15,22,23} Most recently, what had appeared to be a grassroots coalition striving to raise awareness about the hepatitis C virus was actually shown to be a marketing effort run by the pharmaceutical company Schering-Plough Corp to promote their product, Rebetron, which is the primary hepatitis C therapy.²⁴

Vested interests have also found ways to infiltrate professional organizations under the guise of academic neutrality. This can have serious ramifications for national policy, since the credentials and expertise of professional organizations give them high credibility. The International Commission on Occupational Health, which assists in the development of scientific and policy recommendations, recently fell victim to this strategy when several members with a vested interest in the asbestos industry used their affiliation with the commission to develop an International Labor Organization document that was unusually favorable to the industry.^{25,26}

Harassment

In their efforts to squelch unwanted scientific findings, vested interests have also been known to harass investigators, federal agencies, and even the scientific and policy-making processes themselves.^{27,28} For example, a pharmaceutical company, using a variety of approaches, was successful in delaying for years the publication of research results negative to its thyroid treatment product.²⁹ A researcher at Toronto's Hospital for Sick Children was sued by a pharmaceutical company for publishing her negative conclusions about one of the company's products.^{30,31} A Brown University academician and physician became involved in a similar controversy when he discovered a cluster of cases of interstitial lung disease among workers at a local textile flocking industry plant.³² The latter incident is particularly worrisome because the employing institution did not support the right of a faculty member to publish findings, citing the murky restric-

tive covenant that he had signed.³³

It is not only commercial interests that have learned the benefits of harassment. To cite just one example, a group of victims of multiple chemical sensitivity very publicly attacked the scientific integrity of authors who published findings that there was no evidence for an immunologic basis for multiple chemical sensitivity.²⁸

A CASE STUDY OF TACTICS

A case study that illustrates the majority of the strategies discussed above involves an epidemiologic study of diesel exhaust and lung cancer, jointly conducted by NIOSH and the National Cancer Institute. The study is important not only to the more than 1 million US workers who are regularly exposed to diesel exhaust, but to the millions of people worldwide, particularly in the developing world, who are exposed both at work and in the nonwork environment to diesel exhaust.

After conducting a joint feasibility study, NIOSH and the National Cancer Institute initiated peer review of the study protocol in 1995. It was not until 1998, however, that the study actually began. Despite evidence of diesel exhaust's potential carcinogenicity and a strong study design, the Methane Awareness Resource Group, a coalition of mine owners and operators and other industry representatives, initiated litigation in 1996 asserting that the peer review process violated the Federal Advisory Committee Act.³⁴ When multiple subsequent legal efforts failed to block the study, the group lobbied Congress to include language in the

fiscal year 1998 appropriations bill that required both agencies to review the issues once more.³⁵ Additionally, there were attempts to insert more peer review, a fight for access to raw data so that the industry could simultaneously analyze these data and run its own parallel study, public harassment of the study peer reviewers, copious Freedom of Information Act requests, and promotion of congressional inquiries into the most minute details of the study design.

The net result is that an important study with broad occupational and environmental implications has been delayed by many years. In addition, the constant need to defend the science and the scientific process resulted in decreased attention paid to other public health efforts.

RESPONSES TO THREATS TO SCIENCE

The threats to science are exceedingly complex and intertwined. We propose that the scientific community increase its awareness of the existence of these threats and that it mount institutional responses, rather than the issue-by-issue reactions that are now the norm. It is our hope that the responses suggested here will generate discussion among universities, professional societies, government agencies, and individuals about the best ways to ensure the appropriate use of scientific evidence and the protection of the scientists who provide it.

First, consider the context and the source of the attack. It is crucial that we respond appropriately to honest scientific challenges as opposed to challenges issued by vested interests. We currently tend to react too defen-

sively to both, and as a result, the economically and politically powerful can too easily compromise the use of good science. Again, it is important to recognize that although commercial interests are sometimes the most obvious sources of attack, others with vested interests (e.g., victims' groups and their lawyers) may adopt the same tactics.

Second, the scientific community should build and diversify its partnerships, especially in controversial areas. Appropriate involvement, early in the process, of potential critics who are honestly seeking scientific answers helps forestall later unfair attacks. The field of occupational safety and health, for example, is now implementing the National Occupational Research Agenda, an effort launched during a period of agency vulnerability.^{36,37} Some of the harshest critics of a federal role in workplace research are now engaged in guiding and supporting this effort.^{38,39}

Third, institutions and individuals should strive to ensure the transparency of funding sources and an appropriate balance of neutral funding between the public and private sectors. Funding should follow well-delineated guidelines to protect the integrity of the research process—particularly important given the wide variability in conflict-of-interest reporting and policies among the major biomedical research institutions in the United States.⁴⁰

Institutions should agree on rules for publication of research results well in advance to ensure the timely and uninhibited dissemination of scientific findings. Financial disclosure and recusal requirements should be universally implemented for peer-reviewed journals and publications, whose policies currently vary

widely. One recent survey showed that only 43% of medical journals had policies requiring disclosure of conflicts of interest.⁴¹ We should establish additional guidelines to support investigators' right to publish; bar prohibitions against publication; and require carefully structured, third-party review for industry-funded research on industry products.

Professional societies should set limits on the extent and circumstances of industry sponsorship and should raise awareness of the scope and magnitude of threats to science. Individuals should increase their vigilance about accepting gifts, speaking fees, and travel; should be clear about implicit or explicit expectations of private sponsors; and should be careful to ensure that any signed agreements conform with basic institutional requirements for reporting, disclosure, and conflicts of interest.

Fourth, and perhaps most important, we must be on guard to distinguish the point where science ends and policy-making begins. Consider, for example, the 1998 White House decision not to fund needle exchange programs and the 1997 National Institutes of Health decision regarding breast cancer screening. In the case of the needle exchange programs, although emotional and ideologic vested interests had worked successfully to undermine the scientific database, the cumulative evidence was clear in finding that such programs do not increase drug use and do reduce cases of HIV.⁴² The administration recognized the science but nonetheless refused to lift a ban on federal funding of needle exchange programs.^{43,44} Thus, policy was driven by political factors, not scientific ones, and the distinction

was clearly acknowledged—no attempt was made to hide the decision behind the caveat of scientific uncertainty.

Compare this episode with the development of breast cancer screening guidelines. A National Cancer Institute consensus panel concluded that the science was inadequate to support routine screening of women aged 40 to 49 years.⁴⁵ Yet, in response to external pressure from a variety of vested-interest groups with financial and emotional commitments to screening, the science was revisited and repackaged, resulting in the recommendation that women in their 40s be screened every 1 to 2 years.⁴⁶ Both of these examples involve a variety of complex issues, but the bottom line of both is the same: there is a need to more rigorously define and clarify the boundary between science and policy.

Taking steps to protect ourselves against threats to science requires effort, and it would be naïve to assume that science can ever be truly free of vested interests and influences. But it is clear that if we fail to act, we lose an opportunity to strengthen the credibility of scientific evidence in policy-making and to protect scientific researchers and research. The ability to maintain the capacity for evidence-based policy is vitally important to our society. ■

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Contributors

L. Rosenstock conceptualized the main points and wrote the paper. L.J. Lee provided background research and contributed to the writing of the paper.

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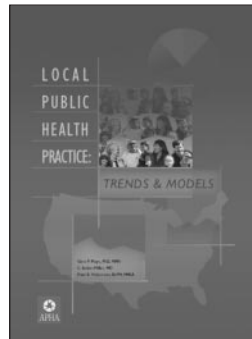
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